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(पहला पुनरीक्षण)

Indian Standard

HYDRAULIC FLUID POWER — FILTER ELEMENTS — VERIFICATION OF MATERIAL COMPATIBILITY WITH FLUIDS

(First Revision)

ICS 23.100.60

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

March 2005

Price Group 3

Hydraulic Fluid Power Systems Sectional Committee, MGP 15

NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical with ISO 2943 : 1998 'Hydraulic fluid power — Filter elements — Verification of material compatibility with fluids' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendations of the Hydraulic Fluid Power Systems Sectional Committee and approval of the Medical Instruments, General and Production Engineering Division Council.

This standard was first published in 1977 based on ISO 2943 : 1974 'Hydraulic fluid power — Filter elements — Verification of material compatibility with fluids'. The ISO Standard has since been revised as ISO 2943 : 1998. To align the standard with international practices, the sectional committee, dealing with the subject, decided to revise IS 8385 : 1977 by adopting ISO 2943 : 1998 as Indian Standard under dual numbering system.

In hydraulic fluid power systems, power is transmitted and controlled through a liquid under pressure within an enclosed circuit. Filters maintain fluid cleanliness by removing insoluble contaminants. The filter element is the porous device which performs the actual process of filtration.

The text of the ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker in the International Standard while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their places are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 2941 : 1974 Hydraulic fluid power — Filter elements — Verification of collapse/burst resistance	IS 8384 : 1977 Method of test for collapse/burst resistance of oil hydraulic filter elements	Technically Equivalent
ISO 2942 : 1994 Hydraulic fluid power — Filter elements — Verification of fabrication integrity and determination of the first bubble point	IS 8383 : 2000 Hydraulic fluid power — Filter elements — Verification of fabrication integrity and determination of first bubble point	do
ISO 5598 : 1985 Fluid power systems and components — Vocabulary	IS 10416 : 1992 Fluid power systems and components — Vocabulary (*first revision*)	Identical

Indian Standard

HYDRAULIC FLUID POWER — FILTER ELEMENTS — VERIFICATION OF MATERIAL COMPATIBILITY WITH FLUIDS

(First Revision)

1 Scope

This International Standard specifies a method of verifying the compatibility of materials comprising a hydraulic fluid power filter element with a designated fluid, by verifying the ability of the filter element to maintain its collapse burst rating after being subjected to the designated system fluid at a high and/or low temperature.

The filter element mounting seal is not included as part of the element.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 2941:1974, *Hydraulic fluid power — Filter elements — Verification of collapse/burst resistance.*

ISO 2942:1994, *Hydraulic fluid power — Filter elements — Verification of fabrication integrity and determination of the first bubble point.*

ISO 5598:1985, *Fluid power systems and components — Vocabulary.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 5598 apply.

4 Equipment

4.1 Temperature bath or **oven** and **cold chamber,** capable of maintaining the fluid temperature to within 5 °C.

4.2 Vessel suitable for containing the fluid and test elements, closed but vented with adequate safety considerations.

4.3 Test fluid, appropriate to the system.

4.4 Temperature instrumentation, accurate to within 1 °C.

5 Procedure

5.1 Subject the filter element to the fabrication integrity test in accordance with ISO 2942.

5.2 Failure of the filter element to exhibit a minimum bubble pressure as designated by the filter manufacturer shall disqualify the element from further testing.

5.3 Rinse the test element in the test fluid. The element shall be deemed to be clean if any test fluid previously used has been removed from the test element. Discard the rinsing fluid.

5.4 Immerse the filter element in the designated system fluid for at least 72 h; the fluid shall be maintained for 72 h continuously, at a temperature 15 °C above the manufacturer's recommended maximum operating temperature. Use new fluid for this operation.

NOTE The 72 h soak at 15 °C above the hydraulic system manufacturer's recommended operating temperature is a practical compromise to achieve an accelerated test rather than a long test at rated temperature.

CAUTION — Do not exceed the safe temperature of the fluid for this high temperature test. This International Standard does not apply in such cases.

5.5 If there is an additional demand for verification of material compatibility with cold fluids, rinse the element as specified in 5.3 and then immerse the filter element in the designated system fluid for at least 72 h. The fluid shall be maintained for 72 h continuously, at a temperature 5 °C below the stated minimum temperature of use.

Use new fluid for this operation. Use a covered container to prevent condensation.

NOTE In case of running tests on both temperature levels it might be convenient to start with the low temperature test in order to use the same test fluid for both tests. Where the high temperature test immediately follows the low temperature test, it is not necessary to renew the test fluid in between tests.

5.6 Subject the filter element to the collapse or burst resistance test in accordance with ISO 2941.

5.7 Report the test information and results as specified in annex A.

6 Criteria for acceptance

6.1 There shall be no visual evidence of structural failure or damage or functional deterioration.

6.2 The collapse/burst test shall be successfully completed as specified in ISO 2941.

7 Designated information

Include the following designated information in documents referring to this International Standard:

a) maximum operating temperature of the filter element;

b) minimum operating temperature of the filter element;

c) system fluid.

8 Identification statement (Reference to this International Standard)

The use of the following statement in catalogues and sales literature prepared by those electing to comply with this International Standard is strongly recommended.

"Filter element material compatibility with fluids determined in accordance with ISO 2943:1998, *Hydraulic fluid power — Filter elements — Verification of material compatibility with fluids.*"

Annex A
(normative)

Reporting method

A.1 Test identification

Date: ....

Operator: ....

A.2 Test element identification

Designation: ....

Manufacturer: ....

Type: ....

Production no.: ....

Batch no: ....

Date of test: ....

A.3 Verification of fabrication integrity in accordance with ISO 2942

Manufacturers designated (rated) minimum value[1]: ....Pa (......................mbar)

Fill in the test conditions and results in table A.1 at the appropriate places in the ISO 2943 procedure:

Table A.1

Test parameter/result	**Initial** (see 5.1)	**After soaking** (see 5.4, and 5.5 if required)	**After burst test** (see 5.6)
Fluid			
Temperature, °C			
Measured bubble point pressure1), Pa (mbar)			
Bubble location2)			
Has rated value been exceeded? (yes/no)			

1) Actually observed value: additional information, not required in ISO 2941.
2) i.e. filter element media, side seam, end cap, etc.

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[1] As specified by the manufacturer.

A.4 Immersion in accordance with ISO 2943:1998, 5.4

A.4.1 Test conditions

Test fluid: ....

A.4.2 Immersion in hot fluid condition

Test temperature: ....°C

Total soak period: ....h; 72 h at test temperature

A.4.3 Immersion in cold fluid condition

Test temperature: ....°C

Total soak period: ....h; 72 h at test temperature

A.4.4 Determination of element condition (in accordance with ISO 2942:1994, 6.1.2 to 6.1.3)

Fill in the test conditions and results in table A.1.

A.5 Determination of collapse/burst pressure in accordance with ISO 2941

A.5.1 Collapse/burst pressure

Rated value[2]: .... kPa (................................ bar)

A.5.2 Test conditions

Test fluid: ....

Test temperature: .... °C

Test flow rate: .... l/min

Nominal flow rate: .... l/min

Pressure drop (Δp) of empty filter housing at test flow rate: .... kPa (........................ bar)

Test contaminant: ....

Mass of contaminant added per unit time:............... g/min ( ) continuously

( ) intermittently

NOTE A continuous recording of $\Delta p = f$ (mass of contaminant added) is recommended for better evaluation.

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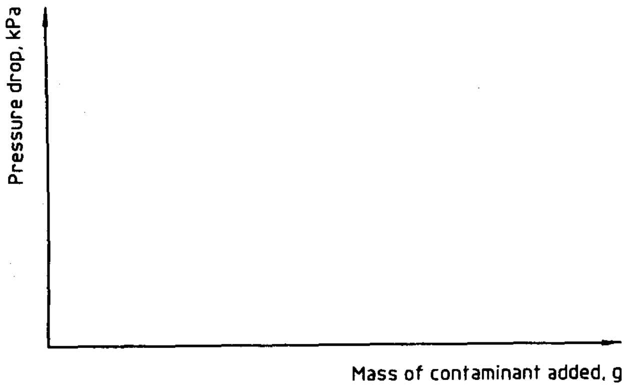
[2] As specified by the manufacturer.

A.5.3 Test result

Collapse/burst pressure:

Measured value : ....kPa (.............................bar)

( ) Rated value reached ( ) Rated value not reached



A.5.4 Determination of element condition (in accordance with ISO 2942:1994, 6.1.2 to 6.1.3)

Fill in the test conditions and results in table A.1.

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